

What Is Claimed Is:

1. An exhaust gas recirculation valve, comprising:
a base including a fluid conduit extending between first and second ports and a valve member disposed within the fluid conduit, wherein the valve member is configured from a closed to an open position by linear displacement of the valve member;
a valve shaft having a first end fixed to the valve member;
a linear actuator including a rotary motor; and
a valve spring is disposed between the actuator and the valve member.
2. The apparatus of claim 1, wherein the motor is a synchronous motor.
3. The apparatus of claim 1, wherein the actuator includes a member coupled to the motor's rotor and the member is disposed adjacent to a second end of the valve shaft.
4. The apparatus of claim 3, wherein the displaceable member includes a disc-shaped end, the valve shaft includes a curved end, and wherein when the valve is configured in the open position, the curved surface is in contact with the member's end.
5. The apparatus of claim 1, wherein the valve member and valve seat comprise a pintle valve.
6. The apparatus of claim 1, wherein the spring is a linear spring.
7. The apparatus of claim 6, wherein the valve shaft includes a flange and the spring is disposed between the flange and the valve member.

8. The apparatus of claim 7, the exhaust gas recirculation valve further including a bracket having a first end secured to the base and a second end, wherein the actuator is disposed above the bracket and the spring is disposed between the bracket first and second ends.

9. An exhaust gas recirculation valve, comprising:

a base having a fluid conduit extending between first and second ports and a valve member disposed within the fluid conduit;

a valve shaft having a longitudinal axis, a first end fixed to the valve member and a second end;

a linear actuator including a rotary motor wherein the motor's rotor has a rotation axis that is substantially parallel to the longitudinal axis; and

a device for positioning the valve member between open and closed positions by linear displacement of the valve member, the device including an actuator shaft coupled to the rotor at a first end thereof and the valve shaft at a second end thereof.

10. The apparatus of claim 9, wherein the motor is a synchronous motor.

11. The apparatus of claim 9, wherein the actuator shaft second end is a disc-shaped end.

12. The apparatus of claim 11, wherein the valve shaft includes a curved end, and wherein when the valve is configured in the open position, the curved surface is in contact with the disc-shaped end.

13. The apparatus of claim 9, wherein the actuator shaft is configurable between a first and second position relative to the valve shaft, the first and second configurations being formed when the actuator shaft second end is in contact with the valve shaft second end and the actuator shaft second end is spaced from the valve shaft second end, respectively.

14. The apparatus of claim 9, wherein the valve member and valve seat comprise a pintle valve.
15. The apparatus of claim 9, further comprising a linear spring that is coupled to the valve shaft.
16. The apparatus of claim 15, wherein the spring is disposed between the actuator and valve member.
17. The apparatus of claim 16, wherein the valve shaft includes a flange and the spring is compressed between the flange and the base when the valve member is configured in an open position.
18. The apparatus of claim 17, the exhaust gas recirculation valve further including a bracket having a first end secured to the base and a second end, wherein the actuator is disposed above the bracket and the spring is disposed between the bracket first and second ends.
19. An exhaust gas recirculation valve, comprising:
 - a base having a fluid conduit extending between first and second ports;
 - a valve member disposed within the fluid conduit;
 - a valve shaft having a first end fixed to the valve member and a second end;
 - a rotary motor having a rotor;
 - a rotation to translation device having a first end coupled to the rotor and a second end;and
 - a coupling between the device and valve shaft, the coupling being of the type that can permit the actuator to be positioned between a first and second position upon displacement of the device, the first and second positions respectively correspondingly to the device second end being spaced from the valve shaft second end and the device second end being in contact with the valve shaft second end.

20. The apparatus of claim 19, wherein the motor is a synchronous motor.
21. The apparatus of claim 19, wherein the device second end has a first cross-sectional area and the valve shaft second end has a second cross-sectional area, the first cross-sectional area being substantially greater than the second cross-sectional area.
22. The apparatus of claim 21, wherein the first area is formed by a disc disposed at an end of a longitudinal shaft.
23. The apparatus of claim 22, wherein the second area is formed by an edge of a curved surface formed at the second end of the valve shaft.
24. The apparatus of claim 19, wherein the valve member and valve seat comprise a pintle valve.